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PROJECT MANAGEMENT PLAN

THIS PLAN OUTLINES THE MANAGERIAL APPROACH TO THE DEVELOPMENT
OF THE SAFE SYSTEM.

APPROVED:

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_____ 11/21/75
DATE

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_____ 11-22-75
HARRY E. FITZWATER, D/OJCS DATE

Monday 1330 in DDA conf room

File Proj. SAFE, p 6.

SAFE PROJECT MANAGEMENT PLAN

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A.   PROJECT OBJECTIVE

The objective of the SAFE Project is to assist in the
analytical process by providing to the analyst advanced
data processing techniques for manipulation and analysis of
raw intelligence and to aid in the production of finished
intelligence. Provisions must be made for the use of
computerized analytical techniques as they are developed
to augment the intellectual process.

This set of capabilities will be made available in the
form of a computer/terminal network providing immediate auto-
matic alerting and distribution of incoming raw intelligence
based on information content, generalized search and retrieval
of data bases for items of interest, building of personal and
organizational files, routing of intelligence, distribution of
repository material, and composition/editing of finished
intelligence.

The following pages outline the management approach to
carrying out this objective.

B.   MANAGEMENT APPROACH

The SAFE development will be carried out as an Agency
in-house project. The system will be defined, designed,
developed, and brought to operation under the management of
the SAFE Project Management Organization (PMO), using a mini-
mum number of Agency staff positions supplemented by con-
tractor personnel. While some predefined tasks may be
contracted with industry when such action will further a
successful implementation, the SAFE management concept does
not envision the selection of a prime contractor with total
responsibility for developing the system. It is planned,
rather, that major elements of the system will be purchased
and that these elements will be integrated in house, again
using contractors as required.

The customer for SAFE will be the Central Reference Service
(CRS) acting for the DDI and DDS&T production offices. The
Systems Analysis Staff within CRS (SAS/CRS) will be responsible
for interfacing with users for definition of the system's
functional characteristics and performance criteria.

The project will be carried out through five distinct
phases, defined as follows for planning purposes:

I. Definition of Requirements: SAS will be
responsible for writing the functional requirements
of the system which will be reviewed by the SAFE
(PMO) and, through a process of continuing feedback
and coordinating meetings, the two organizations will
arrive at a mutual understanding of the requirements
and the implementation ramifications of these
requirements; changes in the basic requirements
will be reviewed by the user representatives
as these ramifications suggest they must. The
final output will be a Requirements Document which
will be approved by SAS, SAFE PMO, and the Joint
Steering Committee made up of the Director and Deputy
Director of Joint Computer Support (OJCS), and the
Director and Deputy Director of CRS. This Require-
ments Document will be the basis for an industry
briefing to solicit ideas in key problem areas
and for system design.

II.   System Design and Analysis:   The SAFE
PMO will develop a systems architecture capable of
meeting these requirements. The results of this ac-
tivity will be an External Reference Specification
(ERS) outlining the external characteristics of the
system. This specification will require the approval
of SAS, SAFE PMO, and the Joint Steering Committee.
This systems architecture will be the basis for an
industry briefing to be made prior to the issuance
of requests for proposals (RFP's) for major elements
of the system in order to solicit ideas and approaches
to refine the RFP's. The logistics and communications
requirements will be specified during this phase.
Additionally, the coordination and responsibilities of
the SAFE project and the Office of Communications
Cable Dissemination System (CDS) and the CRS Automatic
Storage and Retrieval (ADSTAR) projects will be
stabilized during this phase. These projects are
directly related to the SAFE system functions and,
therefore, the coordination and compatibility of
these projects are extremely important.

III. System Development, Acquisition and Test:
This phase will involve the acquisition of hardware
and development of software. Software packages may
include those defined for outside procurement as well
as the in-house development of those additional ele-
ments necessary to produce the final system. The
system will be documented by an Internal Reference
Specification (IRS) which requires SAFE PMO approval
only. Test activity will be a continuation of the
Test and Quality Assurance (T&QA) functions initiated
at the beginning of the design cycle to ensure that a
consistent and structured test program is in place to
meet the reliability requirements. The results of
this activity will be an initial system in place, ready
for acceptance testing by CRS.

IV. Phasing Into Service: During this phase, CRS
will run acceptance tests on the system. The system
will be phased into service either by function or by
organization over a period of time such that all avail-
able functions become operational. It is anticipated
that some functions of the system may be deferred and
brought into operation later than others, hence the
phasing into service may take place in a number of steps.

V.   Operations and Maintenance: During this
phase, the system will be operated as a special single-
purpose data processing center by OJCS, and those
functions which have been deferred or defined as
additions during the development will be developed and
brought on-line as system enhancements. This will be
the on-going phase of the SAFE Project, which includes
the maintenance of the operating environment and
applications software. The organizational responsibilities
for application software maintenance, exploration of
system enhancements, and database management have not
been defined in detail at this time.

C.   ORGANIZATION

The SAFE Project Organization is shown in Figure 1. The in-house organization will consist of managers, technical and support personnel required to define and manage the overall effort. Contractors will be used primarily as consultants and implementers. As noted before, it is not planned that the total system will be contracted for independent development, although some elements may be so contracted.

The functional responsibilities of the organizational components are as follows:

SYSTEMS DEVELOPMENT:

Responsible for   - System Design
                   - Coordination with SAS on functional
                        and processing requirements.
                   - Software specifications and
                        implementation
                   - Acquisition of software "packages"
                   - Methodology of implementation
                   - Software/System documentation
                   - System Integration

OPERATIONS DEVELOPMENT:

Responsible for   - Participant in system design
                   - Physical installation plans and
                        execution
                   - User interface characteristics
                   - System Operation plans and
                        training
                   - Systems Operation - including
                        staffing
                   - Recommendations to PD/SAFE on
                        hardware selection
                   - Coordination with SAS on terminal
                        specifications and selection
                   - Specification of communications
                        and logistics requirements.

QUALITY ASSURANCE AND TEST:

Responsible for
- Setting quantitative reliability objectives that concur with the functional and processing requirements.
- Test plan and execution to ensure meeting objectives
- Coordination of test program with system design and development
- Functional test program for system
- Go no-go recommendation to PD/SAFE at each phase
- Interim SAFE support

PROJECT CONTROL:

Responsible for
- Developing project schedule and monitoring progress
- Financial management
- Control of all documentation
- Primary OL interface for procurement
- Monitor of all contracts
- Briefing aids

The Collateral Support Committee will be made up of senior representatives of OL, OC, OS and any other organizations found to have responsibility for activities upon which SAFE depends but not having direct Project responsibility. This group will be convened periodically by PD/SAFE to ensure that these support activities are planned in concert with SAFE plans, and that they are occurring as planned and will not impede SAFE progress.

Outside Consultants, as noted in the organizational chart, will be used to critique the key system characteristics as reflected by the Requirements Document and system specifications. They will be called upon initially to critique the Requirements Document after an initial review by the SAFE Project and SAS in order to ensure that the requirements can be met, and that the requirements reflect the current state-of-the art for on-line data systems. They will be called in to review the initial system definition work and the final systems specifications in order to ensure that the system as outlined meets the requirements, takes maximum advantage of current and immediate future technology and is achievable.

STAFFING

The staffing for the SAFE Project will be made of ☐ staff slots in FY-76 with an additional ☐ planned for FY-77. The remainder of the team will consist of contract personnel, either contracted individually or as teams. The initial plans for in-house staffing are shown in Figure 1a. The exact contractor staffing will be discussed as a function of the work phasing rather than by fiscal years, and will be in final form only after the first analysis of the Requirements Document. (An initial estimate of Agency staff through 1980 is shown in Figure 1b.)

INTERIM SAFE SUPPORT

As shown in Figure 2, there are currently two organizations within CRS involved in the support of Interim SAFE. These are SAS and Support Services Division (SSD). The OJCS SAFE PMO will assume responsibility for the maintenance of application packages which are unique to SAFE. These packages are as follows: COLTS, OLTA, and, LITTLE SQUIRL. Since personnel previously involved in the maintenance of these packages have been transferred to the SAFE Testing & Quality Assurance organization, and since it is not a full-time activity to support these packages, responsibility for Interim SAFE will be carried out by the Testing & Quality Assurance Branch.

SAS in CRS will have responsibility for user interface and any new user support requirements.

SAFE STEERING COMMITTEE

The SAFE Steering Committee, as shown in Figure 2, will be made up of the D/CRS and D/OJCS, their Deputies, and such other people as they may select. The Committee will be chaired by the D/CRS.
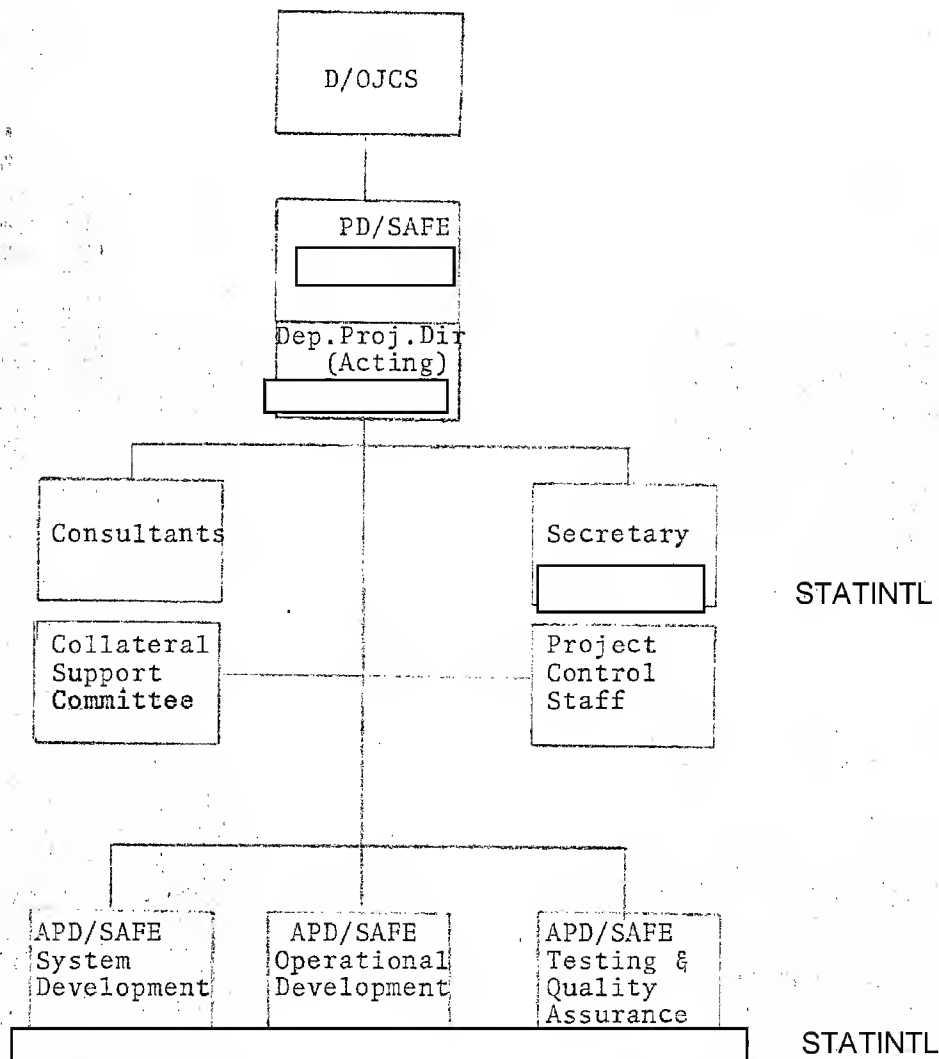
The flow of requirements, specifications and day-to-day work activity coordination will be between the PD/SAFE and C/SAS. Status and work direction will be reviewed periodically by the SAFE Steering Committee, and all final requirements and external specification at the system level will be approved by the D/CRS and D/OJCS as the Steering Committee. These requirements and specifications will then constitute the mutual agreement on the system to be developed.

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Fig 1

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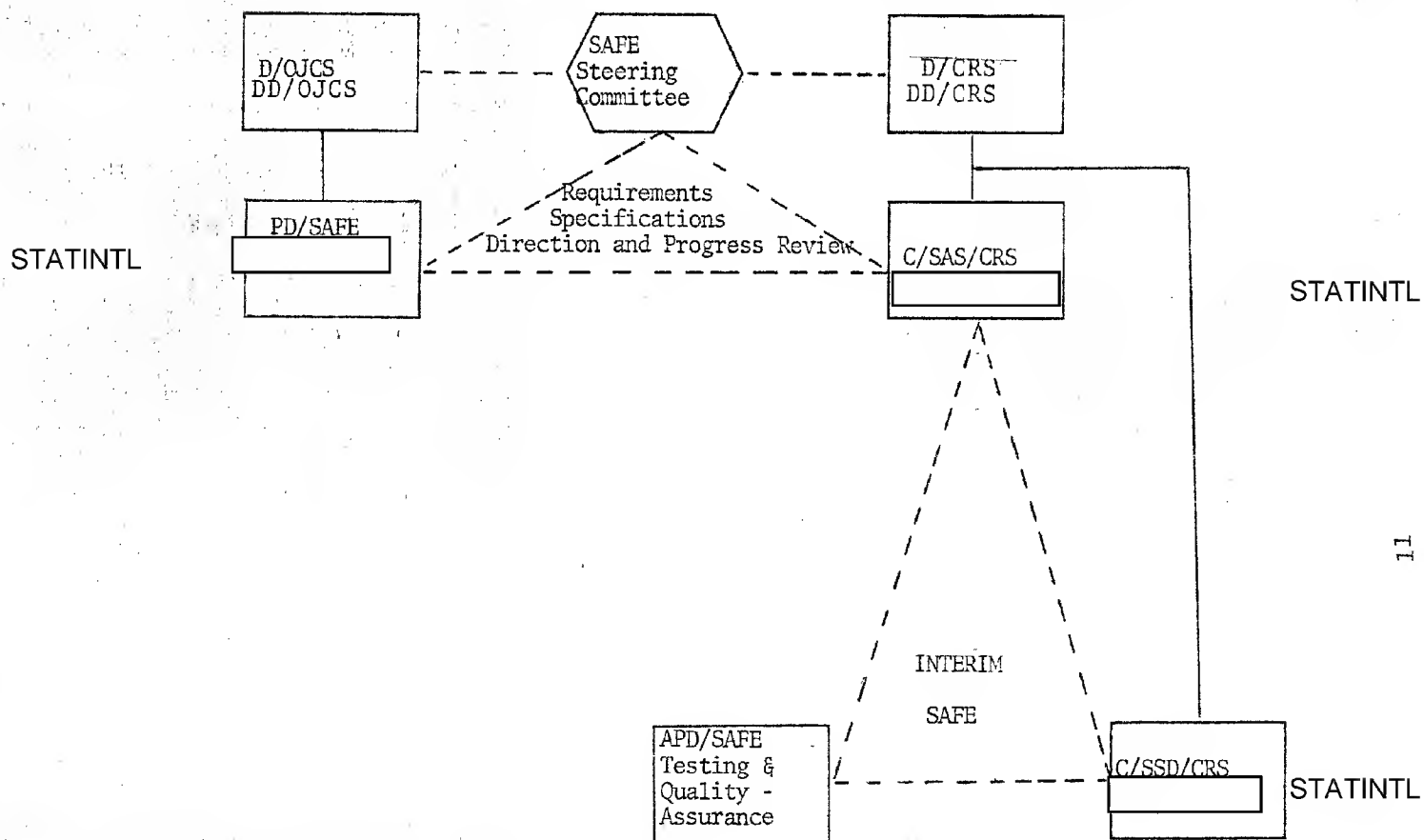
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FIG. 2

D. FINANCIAL MANAGEMENT PLAN

The major financial resources for SAFE will be included in the DDI Management Staff budget. CRS will be responsible for preparing budgetary justifications for SAFE in coordination with OJCS; the major financial resources for SAFE will be included in the DDI Management Staff budget. After appropriate approval, funds will be transferred to OJCS for contractual services, equipment, and facility procurements and other services. OJCS will budget for its staff personnel assigned to the SAFE Project. The APD/SAFE, Project Control will establish controls for each task and for overall project costs.

The budget will be allocated against tasks such that progress and accrued cost can be related. Each manager will be responsible for managing and reporting the cost and progress of his tasks and for providing CRS with whatever data is needed for Project SAFE budgetary justifications.

Cost-to-date and cost for current period will be reported monthly to the D/OJCS with variances of more than five percent explained.

The Project Control Staff will recommend the allocation of funds after receipt of an approved task plan. The monthly project cost summary will report total budget, actual versus planned cost-to-date, allocated versus total budget, and projected cost at fiscal year end. The total project cost projection will be reported semi-annually to the SAFE Steering Committee.

Contracts will be let as CPF, time-and-material or preferably, fixed-price. They will be predictable and measureable and will be reported both as elements of task cost and as individual line items.

The total funds programmed for SAFE to date are as follows:

	FY 1976	FY 1977
DDI	$3,000,000	$10,000,000
OJCS	273,000	575,000
TOTALS	$3,273,000	$10,575,000

E. MILESTONES

(NOTE: Dates beyond 1 January 1976 are subject to detailed
planning and coordination with other organizations in
progress at the date of this document. There may therefore
be changes as dictated by outside constraints or planning
dependencies not yet defined. They are expected to be
minor.)

1. Establish support plan for Interim Safe.   09/15/75

2. Confirm and refine plan for supporting and   09/15/75
    processing Interim SAFE during crisis.

3. Obtain one complete set of first-round func-   09/30/75
    tional Requirements Documents.

4. Conduct formal review of functional require-   12/19/75
    ments with Technical Review Panel.

5. Complete review and generate final Require-   12/31/75
    ments Document.

6. Identify and confirm systems security require-   01/15/76
    ments.

7. Confirm SAFE/CDS system integration and/or   01/15/76
    interfaces.

8. Present initial industry briefing on Require-   02/01/76
    ments.

9. Identify systems communications requirements.   04/15/76

10. Define system architecture.   10/01/76

11. Define site requirements - Rough Order of   11/01/76
    Magnitude.

12. Present second industry briefing (on archi-   11/15/76
    tecture).

13.   Complete detailed System Design.   01/10/77

14.   Prepare bid package for initial hardware   03/01/77
      including evaluation criteria and
      methodology.

15.   Software RFP's.   07/01/77

16.   Initial hardware delivery.   01/78

          See item 11. — No way!

F1. CONTRACT EFFORT

The actual contract effort can not be defined at this time but will be specified as the requirements and architecture are solidified. For management planning of contract definition the development effort may be defined as follows:

1.   Systems Design and Analysis

2.   Terminal and Communication Sub-system

3.   System Software Development.

    a.   Data Management System Development
    b.   Back-up Mode and Communication Mode
    c.   Operating System

4.   Equipment Procurement, Installation and Support

    a.   Mainframes (mini and full size) with Basic
           Support Configuration
    b.   Data Storage
    c.   Terminals
    d.   Supplies

5.   Operations

6.   Facility Preparation

7.   Applications Software Development

8.   Potential Special Development

    a.   Hardware Text Search
    b.   Microfilm Retrieval
    c.   Communications Facility
    d.   Remote Document Viewing

It is planned that contract effort in these areas will be under close control by the project management to ensure proper integration of the final result.

F2. FACTORS IN DETERMINING IN-HOUSE VERSUS OUTSIDE EFFORT

It is noted in the organizational discussion that work done in-house will be done primarily by staff and contract personnel under the direction of Agency management. There will be functions, however, which may be amenable to outside development, and the following will be some of the factors considered in determining which course to take on these activities.

1. Security: Workload for outside contracting must be defined to eliminate security constraints, or must be let to an organization having facilities and personnel cleared to the necessary level.

2. Stability of Requirements: If the requirements are not precisely defined or are questionable, then it is far more difficult to contract this effort than to control it in-house. Poorly defined or change-able requirements result in changing technical direc-tion; this leads to contractual negotations on change-of-scope with lost time and pyramiding costs.

3. Conciseness of Task Definition: Tasks to be contracted must be precisely defined, particularly if bid on a fixed price basis. While lack of conciseness on in-house work may result in wasted motion and cost and some redirection during the program, on a contract effort it will likely result in the delivery of an un-satisfactory product.

4. Required Flexibility: Many of the functions of the initial implementation will change to a degree during the definition as they are exposed to the ulti-mate users. This will be a problem to control, regard-less of how the effort is undertaken. In particular, it will be difficult to control under fixed cost con-straints, although it would be amenable to CPFF manage-ment or in-house effort.

5. Control: It is difficult to control technical effort in a new application. In the event of problems, there is more immediate feedback if the effort is closer to the Project Management team or in-house. As the ef-fort gets further away, there are more people and time involved in trying to take corrective action before the out-of-control condition comes to light. This would indicate that the effort, which may be farmed out, should be that which has least impact on other elements of this system if difficulties are encountered.

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6. <u>Cost</u>: Cost is probably minimum of a well-defined package put out for competitive bids by competent outside organizations. It is least controllable under cost-plus contracts or under in-house efforts. (The only way to control cost on labor-intensive activities is to control the technical schedule.)

7. <u>Available Talent</u>: The primary limiting factor for in-house effort is availability of sufficient numbers of the proper talent levels. It is particularly costly, in terms of schedule and dollars, to undertake effort for which the technical resources are not available.

8. <u>Scope of Effort to be Integrated</u>: A limiting factor on the practicality of outside development is the number and complexity of sub-systems with which that effort must interface. Where sub-systems of any complexity must interface with one another, this effort must be done by the organization having final system responsibility.

9. <u>The Market Place</u>: When systems and software houses are fully loaded, their inclination is to take only tasks which encompass a significant amount of responsibility and provide an opportunity for very substantial profits and/or residual products. When the market becomes tight, these houses become more amenable to time-and-material contracts, either on individuals or groups of people.

10, <u>Need for Support after Installation</u>: In-house competence is needed for post-installation support. This competence must be acquired in-house during development.

F3.   MANAGEMENT OF SAFE PROCUREMENTS

The outline below shows the management structure, responsibilities, and possible Agency component representation that will oversee:

- The writing of RFP's
- Evaluation of the proposals
- Awarding of contracts

It is anticipated that system components will be acquired from several vendors and in varying volumes rather than in one overall procurement. Like elements will be consolidated for contract purposes to provide maximum price leverage in negotiations, i.e., all central processors or all memories. On the other hand, sub-systems such as terminals, communications, mini or special computers, etc., will be procured separately to permit competitive bidding by a wider range of vendors, to take advantage of special expertise available in industry, and avoid over-dependence on and vulnerability to one vendor.

Therefore, a number of RFP's will be generated, and a number of contracts will be let to make up the total system. The range of contracts may be from one-hundred thousand to several million dollars.

The following outlines the transitory organizations involved in the procurement process and their responsibilities. The objective is to ensure proper participation by concerned organizations, fair procurement practices, and maximum value to the government for the expenditure involved.

I. SOURCE SELECTION AUTHORITY:

D/OJCS - Responsible for:

> Final Agency selection of the winning bidder based on technical assessment, price, and other factors.

D/OL - Responsible for:

1) Final Agency contract negotiation upon receipt of obligation of funds authorization.

2) Contract award to the successful bidder.

II. SOURCE SELECTION BOARD

1) Responsible for:

Recommending a winning bidder to the Source Selection Authority. The recommendation is based, in part, on a review of the proposal evaluation performed by the Source Evaluation Board.

2) Composition:

PD/SAFE (Chairman)
CRS/SAS
OL/PD/ADP&ES
APD/SAFE/SYSTEM DEVELOPMENT*
APD/SAFE/OPERATIONAL DEVELOPMENT*
APD/SAFE/PROJECT CONTROL*
APD/SAFE/TESTING & QUALITY ASSURANCE*

III. SOURCE EVALUATION BOARD

1) Responsible for:

Reviewing RFP's, establishing evaluation criteria, evaluating proposals, and ranking bidders based on technical and cost consideration.

Establishing bidders' list and its subsequent submission for review to the RFP Review Panel (below).

Presenting recommendations and rationales to the Source Selection Board.

2) Composition:

APD/SAFE/OPERATIONAL DEVELOPMENT (Chairman)
APD/SAFE/PROJECT CONTROL
APD/SAFE/SYSTEM DEVELOPMENT
APD/SAFE/TESTING & QUALITY ASSURANCE
CRS/SAS

*when appropriate

IV. RFP REVIEW PANEL

1) Responsible for:

Reviewing the bidders' list

Predistribution review of the RPF to assure its technical, administrative, and legal soundness and clarity

Recommending changes in the bidders' list and RFP to the Source Evaluation Board.

2) Composition:

APD/S/PC (Chairman)
CRS/SAS·
ORD/Data Processing Research Division*
OL/Real Estate & Construction Division/
    Headquarters Engineering Branch*
OS/Information Systems Security Group
OC/Engineering/Engineering Support Division*
APD/S/OD
APD/S/SD
APD/S/T&QA

V. SAFE PROJECT

Responsible for writing RFP's. Hardware RFP's will be written by Operations Development. Software and Systems Integration RFP's will be written by Systems Development. Project Control will be responsible for processing all RFP's through the procurement groups outlined above.

* when appropriate

G. STUDY METHODOLOGY

A number of key technical problems have been identified in the development of the SAFE Project and more will be found as the specifications are further refined. A problem log will be established in which each problem will be defined as it is identified and potential approaches will be listed. These statements and approaches will then be used for further definition and analysis within the Project and for the initiation of early investigative efforts which must take place in order to determine the feasibility of various approaches.

An example of these problems would be the remote viewing of centrally filed hardcopy documents.

Problem Statement: There is a need to view repository documents at the analysis site, to page back and forth through these documents, and to produce local hard copy upon command. Documents will normally be on microfilm.

Potential Approaches:

1. Regional Microfilm Storage/Viewing Stations
2. Central Video file with TV transmission to the viewing site
3. Automatic picking of microfilm with video scan (TV) distribution or high-speed, scan-facsimile transmission
4. If time requirements are not critical, use fast-copy service and either manual or pneumatic tube distribution
5. Compute Input Microfilm (CIM)

NOTE: Cost will be one of the critical factors in final determination of competing architectures.

Such problem statements will provide the basis for group problem-solving sessions where technical personnel outside the Project, as well as Project personnel, can participate in outlining various problem solutions. The problem log will be used only for major technical problems rather than normal developmental difficulties.

H.   PROJECT REVIEWS AND REPORTS

In addition to the weekly abbreviated reports and the Monday CRS-OJCS Interface Meetings and the bi-monthly MBO reports, a formal review will be held monthly with the Joint Steering Committee. This review will cover progress against plan, financial commitment to date, status of key problem areas, and plans for the following month.

External Reference Specifications will be reviewed with the Joint Steering Committee and with the using analyst population as they are completed. These reviews will provide feedback to the Project within a time frame when action can still be taken to correct deficiencies noted.

Additionally, PD/SAFE will establish a system of design reviews for each element of the system to ensure overall architectural integrity, to critique the design, and to apply proper management judgment to design decisions. The review panels will be selected as appropriate to the subject matter.

I.   INDUSTRY RELATIONSHIPS

It is the intent of the Project to gain the maximum possible advantage to the Agency from the meaningful participation of the industrial community in Project SAFE. Procurements will be open and competitive and the specialized knowledge of various segments of the industry will be brought to bear on the development of the system and preparation of SAFE specifications. To this end, two industry briefings are currently planned as follows:

Within two months of the completion of the Requirements Document, industry will be invited to a briefing on the summary of the requirements defined to give them a picture of the overall SAFE environment and requirements, and to solicit voluntary feedback on possible approaches to meet some of these requirements, and on the realizability of the requirements in general. This should also help many companies to determine whether they wish to participate further in the later phase of SAFE development.

After a systems architecture is defined which appears to meet the SAFE requirements, another briefing will be held to outline the proposed architecture, with the objectives of soliciting industry reaction concerning the approach taken, and to elicit novel approaches which perhaps have not been incorporated. We would anticipate that after this briefing, there would be meaningful responses from the major hardware and software companies reflecting their best efforts to solve the problems or to influence the solution which will be embodied in the request for proposals for major elements of the system.

The Office of Logistics will be involved in the preparation of these briefings in order to avoid creating an unrealistic set of expectations within the community. Their advice will also be sought prior to this time to avoid establishing conflict of interest situations which might preclude some companies from bidding in later phases of the Project.

J. SYSTEM DOCUMENTS HANDLING

The SAFE Requirements Document will be generated by CRS/ SAS with such assistance as may be requested from the SAFE Project. It will be transmitted to the PD/SAFE for review and will be considered final when signed jointly by PD/SAFE, C/SAS and the SAFE Steering Committee. This will require review of interim specifications and collaboration on a continuing basis.

This "System Requirements Document" will become the system functional objective for SAFE development. A change to this document, once approved, will require approval as noted in the Configuration Control section of this plan.

The system design will be defined in an "External Reference Specification" (ERS), which reflects system function and behavior as seen from an external point, and by an "Internal Reference Specification" (IRS), which documents the internal design (which a user might never perceive). The ERS must embody the perform- ance documented in the Systems Requirements Document and hence requires concurrence by C/SAS and PD/SAFE as well as the SAFE Steering Committee. The IRS requires SAFE/PMO approval only.

A "System Reference Manual" will be written from the final ERS and will constitute the complete documentation required to use the system in any application.

An "Operational Procedures Manual" will be written for operators. (Users will, however, employ tutorial aids and simple instruction rather than manuals.) The user tutorial aids will be written by SAS.

K.   CONFIGURATION CONTROL

In order to ensure development of an operational system, the specification, design, configuration, and intermediate products must be brought under management control. This will be done by designating "Control Documents" and specifying procedures for approval of and changes to these documents.

The Control Documents are:

    1.   Systems Requirements Documents
    2.   External Reference Specification
    3.   Internal Reference Specification

The levels of approval required for each document are as follows:

	Requirements	ERS	IRS
Initial Approval	PD/SAFE, C/SAS, Steering Committee	PD/SAFE, C/SAS, Steering Com.	PD/SAFE
Class I Changes	Same	Same	Same
Class II Changes	PD/SAFE	PD/SAFE	PD/SAFE

Class I changes are those which substantially alter the functional characteristics of the system in a significant way as seen by the user.

Class II changes are those which clarify or correct a document without substantially altering the functional characteristics.

Once approved, these documents will be under the control of APD/Project Control who will pre-screen all change requests. These requests will be reviewed at the appropriate level, and recommendations made to the PD/SAFE who will approve or reject them, or refer them to the Steering Committee as appropriate.

As the system is further defined, the Control Documents may be further broken down for ease of management, and at that time specific controls will be specified for each new element.